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Date of Deposit: Nov 21, 2005 By: James E. Bradley
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES
IN THE UNITED STATES PATENT & TRADEMARK OFFICE

In re application of: **Dan L. Adams**	§	Docket No.: **104-26964**
	§	
Serial No: **10/687,476**	§	
	§	Group Art Unit: **1744**
Filed: **10/16/2003**	§	
	§	
For: **Biocide Impregnation of Coatings for ESP Components**	§	
	§	Examiner: **Krisanne Marie Jastrzab**

APPEAL BRIEF

This is an appeal from the final rejection of claims 15 - 32 in the above referenced patent application. The final action is dated 05/26/2005.

I. REAL PARTIES IN INTEREST

Baker Hughes Corporation is the only real party in interest regarding the captioned patent application.

II. RELATED APPEALS AND INTERFERENCES

There are none.

III. STATUS OF CLAIMS

A. Total Number of Claims

Thirty-two (32) claims were originally filed in the application, and eighteen (18) claims remain for consideration.

B. Status of the Claims

1. Claims cancelled: 14
2. Claims withdrawn (but not cancelled): None
3. Claims pending: 18
4. Claims allowed: None
5. Claims rejected: Claims 15-32.

C. Claims on Appeal

Claims 15 - 32 are presently on appeal.

IV. STATUS OF AMENDMENTS

Claims 15-32 were finally rejected in an office action dated 05/26/2005.

V. SUMMARY OF THE INVENTION

A submersible well pump assembly has a number of stages driven by a downhole electrical motor. Each stage has an impeller and diffuser. In the method of this invention, portions of the impellers and diffusers are coating with a substance that contains a biocide prior to lowering the pump into the well. The pump assembly is subsequently lowered into the well and operated conventionally. The coating on the portions of the impellers and diffusers retard the growth of bacteria.

VI. ISSUES

1. Whether claims 15-20 and 24-29 are unpatentable under 35 U.S.C. § 103(a) for obviousness over Patton (US 3,335,791) in view of Speed (US 4,462,758).

2. Whether claims 21 and 30 are unpatentable under 35 U.S.C. § 103(a) for obviousness over Patton in view of Speed and further in view of McClafin (US 4,605,069).

3. Whether claims 22, 23 and 31-32 are unpatentable under 35 U.S.C. § 103(a) for obviousness over Patton, Speed and McClafin and further in view of Byassee et al (US 5,783,117).

VII. GROUPING OF CLAIMS

1. Claims 15-20 and 24-29 are grouped with respect to issue 1 set forth above. Applicant suggests that the Board choose claim 28 as representative of the first issue.

2. The second issue involves claims 21 and 30. Applicant suggests that the Board choose claim 21 as representative of the second issue.

3. Claims 22, 23 and 31-32 are grouped with repsect to the third issue, and Applicant sugests that the Board choose claim 22 as representative of the third issue.

VIII. ARGUMENT

Patton discloses a well pump 27 for pumping industrial and domestic water. Pump 27 is located in the well and driven by a motor 31 at the surface, which rotates a shaft 26 leading to pump 27. As shown in Figure 4, shaft 26 is supported by bearings 36, 37, 37', 38, 38' and 38". Turbine oil from a container 50 flows down a tube 52 into a conduit 34 surrounding drive shaft

26 for lubricating the bearings. Normal leakage allows the oil to escape into the well water in chambers 21 and 10, thus it is replenished from container 50.

The pump has periods of inoperation (Co. 2, line 26), and during this time, the turbine oil causes a black or dark green scum to appear on the pump components. The bacteria creating the scum causes an undesirable odor or taste in the water (Col. 2, line 68). Patton teaches to incorporate an emulsifying agent in the lubricant at the surface to cause the lubricant to disperse within the well water (Col 3, lines 13015). Also, a bactericide is provided in the reservoir 50 at the surface, because the bacterial growth is believed to be developed from within the oil (Col. 4, lines 15-18). The bactericide is soluble in the turbine oil and insoluble in water. The bactericide inhibits the growth of bacteria on the pump parts due to the escape of the turbine oil. Apparently it is common for about one quart of oil to be dispensed daily down conduit 34.

Speed discloses a water well pump 15 for rural residences. The motor 21 and pump 15 are submerged in the well. No lubricant is supplied to the motor or pump from the surface. There is no mention of any bacteria problems or any biocide being used to control the bacteria.

Applicant's claim 28 require incorporating a biocide into a coating, applying the biocide-incorporated coating onto at least portions of the impellers and diffusers one or more components of the pump, then attaching an electrical motor to the pump, and lowering the pump and motor into the well.

Applicant submits that one viewing Patton would see no motivation to coat the stages of the pump of Speed prior to lowering the pump into the well because in Patton teaches that the turbine lubricant being delivered down the well from the surface causes the bacteria growth. Patton teaches that the bacteria growth on the pump parts results from the turbine oil leaking into

the water being pumped. There is no recognition between these two references that bacteria would grow on the pump components unless turbine oil is pumped down the well. Speed does not supply turbine oil from the surface to the pump. Speed does not employ a turbine shaft extending into the well and having bearings that require lubrication. Even if Speed encountered a bacteria problem, he would not look to Patton for the solution because Speed does not pump lubricant down the well. Even if combined, the combination teaches to incorporate a bactericide and an emulsifying agent into turbine oil, and to dispense the turbine oil down a tube to the downhole pump assembly.

Lubricant is not pumped down the well to the pump assembly in Applicant's invention, either. Applicant submits that one skilled in the art would not realize that a suitable biocide coating placed on the pump stages before lowering the pump into the well would last until the regular maintenance time for pulling of the pump for repair or replacement. Electrical submersible pumps of the type herein often are not pulled for maintenance until 18 months or more of continuous use. Patton does not mention coatings, thus makes no suggestion that a biocide coating on the pump components would last that long.

In regard to the second issue, McClaflin does not deal with a rotary pump, rather deals with a jet pump. McClaflin pointed out that jet pumps in the past had not been suitable for pumping heavy viscous crude oil because of cavitation. In McClaflin, power fluid is pumped down into annular space 10, where it flows inward into the jet pump as indicated by the arrows b. The fluid flows up a nozzle 34, causing a flow of well fluid as indicated by the arrow a. In order to pump the heavy viscous crude, a surfactant solution is introduced into the fluid flowing down annular space 10. A biocide is mixed with the surfactant. The preferred biocide is gluteraldehyde (Col. 4, line 57).

Claim 21, which depends from claim 15, states that the biocide is selected from a group that includes glutaraldehyde. If Pattan used such a biocide, applicant submits there is no motivation for Speed to employ the biocide because Speed does not dispense a lubricant or any type of fluid down the well to the pump. Even if combined, the result would not teach to apply a coating to the pump components, then lower the pump and motor into the well. Similar to Patton, in McClaflin, a power fluid and surfactant must be pumped down annular space 10. The biocide is added to the power fluid. The combination of Patton and McClafin teaches to pump a fluid down the well to the pump, the fluid containing a biocide.

Considering the third issue, Byassee deals with a household evaporator humidifier, which applicant submits is not analogous art to a downhole well pump. In Byassee, as shown in Figure 4, the householder places water 50 in a container 30, possibly on a daily basis. Water 50 flows into the base platform 16 to a selected level. Motor 56 is located above the water and connected by a shaft 70 for rotating impeller 84 of pump 80. Pump 80 pumps the fluid up, as indicated by the arrows 104, to a chamber above an evaporator panel 128. The water flows downward into evaporator panel 128 through which air is drawn by fan 66. The air, moistened by water in evaporator panel 128, discharges into the room.

A number of the components in Byassee are made of molded plastic that contains a biocide or antimicrobial agent incorporated therein for resisting or retarding the growth of bacteria. As set forth at column 8, lines 20-27, these components include the following: the base platform 16; housing parts 78 and 80 of pump assembly 76; pump impeller 82; hollow column 72; outlet conduit 96; pipe 100; and frame 122. Applicant requires a biocide coating on the pump components, not a biocide incorporated into molded material such as polypropylene. The

use of a coating allows applicant to use metal components, rather than molded plastic components.

Byassee also teaches that the evaporator panel has a fired clay-based covering or coating incorporated, the clay-based covering containing a biocide. The coating is hydrophilic to enhance the ability of the evaporator panel to retain water. Applicant submits that one would not wish to place such a clay-based coating on a pump component. Certainly Byassee does not suggest such a coating to be placed on any of the housing parts, pump parts or base platform, rather teaches to use a molded plastic having a biocide incorporated therein.

Claim 22 depends from claim 15 and states that the biocide is from a group of materials that includes chlorine. Even if the Byassee suggests a biocide containing chlorine, applicant submits that one viewing either Patton or McClaflin would not be led to utilize a coating on the pump stages because a ready supply of fluid would be delivered to the downhole pumps of Patton and McClaflin regardless whether or not the pump stages contained such a coating. It would be far easier to simply include some biocide material into the lubricant or power fluid being delivered to the pump rather than to coat the pump stages.

Also, even if one did try to combine Patton, Speed and McClaflin with Byassee, the combination would not meet the requirements of the claims. The combination would teach to make the pump components of molded plastic with a biocide incorporated in the material. The combination would not suggest coating the components of the pump with the biocide. The use of the clay-based coating on the evaporator would not be of any relevance to Patton, Speed and McClaflin because neither uses evaporators downhole with its pump assemblies.

IX. APPENDIX

The Appendix provides a copy of the claims presented in this appeal.

X. CONCLUSION

For the foregoing reasons, it is submitted that the Examiner's rejections of claims 15-32 are erroneous and reversal of the Examiner's decision is respectfully requested.

Please charge the fee of $500 and any additional fees to Baker Hughes Corporation deposit account 02-0429.

Respectfully submitted,

Date: Nov 21, 2005

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APPENDIX

15. A method of inhibiting bacteria from growing in a submersible well pump, comprising the steps of:

(a) incorporating one or more biocides in a coating;

(b) applying the biocide-incorporated coating to the internal and/or external surfaces of one or more components of the pump; then

(c) connecting an electrical motor to the pump and lowering the pump and the motor into the well; and

(d) supplying electrical power to the motor to operate the pump, wherein bacterial growth is inhibited.

16. The method of claim 15, wherein step (a) comprises mixing the one or more biocides while in a dry state with the coating while in a liquid state.

17. The method of claim 15, wherein step (a) comprises mixing the one or more biocides while in a granular state with the coating while in a liquid state.

18. The method of claim 15, wherein step (a) comprises mixing the one or more biocides while in a liquid state with the coating while in a liquid state.

19. The method of claim 15, wherein the one or more biocides are in a microscopic time release capsule.

20. The method of claim 15, wherein step (b) comprises either by dipping or spraying the one or more components of the pump with the coating while in a liquid state.

21. The method of claim 15, wherein the biocide is selected from the group consisting of acrolein, formaldehyde, glutaraldehyde, sodium dichlorophenol, acetate salts of coco amines, acetate salts of coco diamines, acetate salts of tallow diamines, alkyl amino, alkyl dimethyl ammonium chloride, alkyl phosphates, coco dimethyl ammonium chloride, paraformaldehyde, sodium salts of phenols, and substituted phenols.

22. The method of claim 15, wherein the biocide is selected from the group consisting of bromine, chlorine, sodium hydroxide, calcium sulfate, and salts made from different metals.

23. The method of claim 20, wherein the metals include copper, arsenic, tin, lead and zinc.

24. A method of inhibiting bacteria from growing in a submersible well pump, comprising the steps of:

(a) providing a pump with a housing and at least one rotary pump stage located therein, the pump stage having at least one passage for the flow of well fluid;

(b) applying a coating to the passage with a substance having a biocide that controls the activity of bacteria; then

(c) connecting an electrical motor to the pump and lowering the pump and the motor into the well; and

(d) supplying electrical power to the motor to operate the pump to cause well fluid to flow through the passage of the pump stage and to the surface of the well, the well fluid flowing over the coating, thereby inhibiting bacterial growth.

25. The method of claim 24, wherein step (b) comprises either by dipping or spraying the pump stage with the coating while in a liquid state.

26. The method of claim 24, wherein the pump of step (a) comprises a centrifugal pump, the pump stage of step (a) comprises an impeller and a diffuser, and the at least one passage comprises an impeller passage and a diffuser passage; and step (b) comprises applying the coating to the impeller and the diffuser passages.

27. The method of claim 24, wherein the pump of step (a) comprises a progressing cavity pump.

28. A method of inhibiting method of inhibiting bacteria from growing in a submersible well pump, comprising the steps of:

providing a centrifugal pump with a housing and a plurality of pump stages located therein, each of the pump stages having an impeller and a diffuser;

applying a coating to at least portions of the impellers and diffusers with a substance that contains a biocide that controls the activity of bacteria; then

connecting an electrical motor to the pump and lowering the pump and the motor into the well; and

supplying electrical power to motor to cause the pump to rotate the impellers, causing well fluid to flow through the impellers and diffusers in contact with the coating to inhibit bacterial growth on the impellers and diffusers.

29. The method of claim 28, wherein the coating is applied either by dipping or spraying the impellers and the diffusers with the coating while in a liquid state.

30. The method of claim 28, wherein the biocide is selected from the group consisting of acrolein, formaldehyde, glutaraldehyde, sodium dichlorophenol, acetate salts of coco amines, acetate salts of coco diamines, acetate salts of tallow diamines, alkyl amino, alkyl dimethyl ammonium chloride, alkyl phosphates, coco dimethyl ammonium chloride, paraformaldehyde, sodium salts of phenols, and substituted phenols.

31. The method of claim 28, wherein the biocide is selected from the group consisting of bromine, chlorine, sodium hydroxide, calcium sulfate, and salts made from different metals.

32. The method of claim 31, wherein the metals include copper, arsenic, tin, lead and zinc.